

Remarks

This response is being submitted within the shortened statutory period set for responding to the office action that was mailed on August 20, 2003. Therefore, no petition and fee for an extension of time is enclosed with this response.

Applicants submit a Request for Continued Examination (RCE) under 37 CFR 1.114. Therefore, an RCE transmittal and a check in the amount of \$770 is enclosed with this response.

Please amend currently pending claims 1, 5, 10, 14 and 15. Please add new claims 16-18. Please cancel currently pending claims 6 and 7. Upon amendment, the above-identified US patent application will have four independent claims (currently amended claims 1, 10, 14 and 15) and 16 total claims (currently pending claims 2, 3, 4, 8, 9, 11, 12 and 13, amended claims 1, 5, 10, 14 and 15, and new claims 16-18). Applicants paid for up to four independent claims and 20 total claims. Therefore, no fee for excess claims is enclosed with this response.

Claim rejections 35 U.S.C. 102.

1. Rejection of currently pending claims 1, 4 and 15 under 35 U.S.C. 102(b) as being anticipated by Wang.

The Examiner rejects currently pending claims 1, 4 and 15 under 35 U.S.C. 102(b) as being anticipated by US Patent No. 5,277,890, hereinafter called Wang. Applicants submit that currently pending independent claims 1 and 15 have been amended by incorporating limitations of currently pending claim 6. However, currently pending claim 6 was not rejected under 35 U.S.C. 102(b) in view of

Wang. Applicants therefore respectfully submit that the rejection of amended independent claims 1 and 15 and currently pending dependent claim 4 now be withdrawn.

2. Rejection of claim 1 under 35 U.S.C. 102(b) as being anticipated by Mellors.

The Examiner rejects currently pending claim 1 under 35 U.S.C. 102(b) as being anticipated by US Patent No. 4,590,059, hereinafter called Mellors. Currently pending claim 1 has been amended by incorporating limitations of currently pending claim 6. However, currently pending claim 6 was not rejected under 35 U.S.C. 102(b) in view of Mellors. Applicants therefore respectfully submit that the rejection of amended independent claim 1 now be withdrawn.

3. Rejection of currently pending claims 1, 2, 4, 5, 14 and 15 under 35 U.S.C. 102(b) as being anticipated by Sheargold.

The Examiner rejects currently pending claims 1, 2, 4, 5, 14 and 15 under 35 U.S.C. 102(b) as being anticipated by US Patent No. 5,702,679, hereinafter called Sheargold. Applicants submit that currently pending independent claims 1, 14 and 15 have been amended by incorporating the limitations of currently pending claim 6. However, currently pending claim 6 was not rejected under 35 U.S.C. 102(b) in view of Sheargold. Applicants therefore respectfully submit that the rejection of amended independent claims 1, 14 and 15 now be withdrawn as well as the rejection of the claims dependent therefrom.

4. Rejection of currently pending claim 1, 2, 4 and 5 under 35 U.S.C. 102(b) as being anticipated by JP 11343120.

The Examiner rejects currently pending claims 1, 2, 4 and 5. Applicants submit that independent claim 1 has been amended by incorporating the limitations of currently pending claim 6. However, currently pending claim 6 was not rejected under 35 U.S.C. 102(b) in view of JP 11343120. Applicants therefore respectfully submit that the rejection of amended independent claim 1 now be withdrawn as well as the rejection of the claims dependent therefrom.

5. Rejection of currently pending claims 1, 2, 4, 5, 10, 14 and 15 under 35 U.S.C. 102(e) as being anticipated by Manev.

The Examiner rejects currently pending claims 1, 2, 4, 5, 10, 14 and 15 under 35 U.S.C. 102(e) as being anticipated by US Patent No. 6,280,699, hereinafter called Manev. Applicants submit that currently pending independent claims 1, 10, 14 and 15 have been amended by incorporating the limitations of currently pending claim 6. However, currently pending claim 6 was not rejected under 35 U.S.C. 102(e) in view of Manev. Applicants therefore respectfully submit that the rejection of amended independent claims 1, 10, 14 and 15 now be withdrawn as well as the rejection of the claims dependent therefrom.

Claim rejections 35 U.S.C. 103

I. The Examiner rejects under 35 U.S.C. 103(a) in the office action:

1. Claims 1, 2, 4, 5, 8, 9, 10, 14 and 15 over Manev on page 4.
2. Claims 1, 2, 4-9, 14 and 15 over Howard in view of Schulz on page 5.
3. Claims 1, 2, 8-9, 14 and 15 over Manthiram in view of Schulz on page 6.

4. Claims 1-5, 8-9, 14 and 15 over Christian in view of Schulz on page 7.
5. Claims 1, 2, 4, 5, 8, 9, 14 and 15 over Sheargold on page 8.
6. Claims 1, 2, 4-9, 14 and 15 over Sugeno in view of Schulz on page 8.
7. Claims 1, 2, 4, 5, 8, 9, 14 and 15 over JP 08102323 in view of Schulz on page 10.
8. Claims 1, 2, 4-9 and 15 over JP 01263547 in view of Schulz on page 10.
9. Claims 1, 2 and 4-15 under JP 2000294239 in view of Sugeno and further in view of Schulz on page 11.

In addition to the arguments filed with our response of June 20, 2003, the Applicants file the following arguments.

II. Amended independent claims 1, 10, 14 and 15.

As already explained in the proceeding section on dealing with the rejections under 35 U.S.C. 102, independent claim 1 has been amended by incorporating the limitations of currently pending claim 6 to result in currently amended independent claim 1 which has the following wording.

A method for preparing a manganese compound for a lithium manganese complex oxide, comprising the step of simultaneously applying a mechanical force from 0.1 to 1000 dyne/cm² and a heat energy from 50 to 200 °C at a time from 5 minutes to 5 hours to a manganese compound to remove defects present in particles of said manganese compound, and to control the aggregation of microparticles and the shape of the aggregated particles.

III. The currently amended independent claims 10, 14 and 15 have the same claim limitations.

Since currently pending claim 6 has not been rejected under 35 U.S.C. 103(a) over the prior art as listed in section I in items:

1. Rejection over Manev.
3. Rejection over Manthiram in view of Schulz.
4. Rejection over Christian in view Schulz.
5. Rejections over Sheargold.
7. Rejection over JP 08102323 in view of Schulz.

It is respectfully submitted that these rejections under 35 U.S.C. 103(a) should be withdrawn now in view of amended independent claims 1, 10, 14 and 15.

IV. The rejections as listed in the preceding paragraph under items:

2. Rejection of independent claims 1, 14 and 15 over Howard in view of Schulz.
6. Rejection of independent claims 1, 14 and 15 over Sugeno in view of Schulz.
8. Rejection of independent claims 1 and 15 over JP 01263547 in view of Schulz.
9. Rejection of independent claims 1, 10, 14 and 15 over JP 2000294239 in view of Sugeno and further in view of Schulz will be discussed in the following sections.

V. Prima facia case of obviousness.

The Examiner is respectfully reminded that to establish a prima facia case of obviousness, three criteria must be met.

-First, there must be some suggestion or motivation either in the

reference itself or in the knowledge generally available to one of ordinary skill in the art to modify the reference teaching.

-Second, there must be a reasonable expectation of success.

-Finally, the prior art reference must teach or suggest all the claim limitations (MPEP 2142).

Applicants submit that the Examiner has failed to satisfy these criteria in regard to currently pending claim 6 and in regard to currently amended independent claims 1, 10 14 and 15 in asserting that the rejected claims are obvious in view of the above combined reference teachings.

The Examiner is further respectfully reminded that the teaching or suggestion to make the claimed combination and the reasonable expectation of success must be found in the prior art, therefore, in the combined reference teaching and not Applicants' disclosure.

VI. Re: item 2, rejection of currently pending claims 1, 2, 4-9, 14 and 15 under 35 U.S.C. 103(a) as being unpatentable over Howard in view of Schulz.

The Examiner acknowledges on page 6, first paragraph, that Howard does not disclose what force is applied to the reactants during the mixing. The Examiner further acknowledges in paragraph 2 on page 6 that Howard does not disclose "mixing takes place simultaneously with heating". Applicants submit that Howard teaches in column 6, lines 17-25 the intimate mixing of the reactants. Howard clearly teaches not to heat the reactants. Heating requires energy and raises the process costs. The person skilled in the art would not be motivated to simultaneously mix and heat the reactants because Howard teaches not to do it. The Examiner asserts that Schulz teaches that "simultaneously grinding and heating reduces the amount of energy

required of grinding and heating separately". The Examiner further asserts that "it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the mixing and heating steps as disclosed by Schulz with the teaching of Howard and to arrive at the claimed invention".

The Applicants respectfully traverse the Examiner's assertion. The Applicants agree with the Examiner that Howard and Schulz do not teach or suggest all the claim limitations since neither Howard or Schulz teach or suggest the mechanical force as claimed in the independent claims. Applicants submit that the claimed mechanical force applied to the manganese compound is in a range in which the three dimensional destruction of the aggregate particulate unexpectedly and surprisingly does not occur. See the description on page 8, second paragraph. As already explained, neither Howard nor Schulz teach or suggest applying the force to the reactants. The Applicants submit that the Examiner has failed to provide some suggestion of the desirability of doing what the inventor has done according to the claimed invention.

The references do not expressly or implicitly suggest the claimed invention for the following reasons. Howard teaches a process of making an intercalation composition having a spinel structure with crystallites of Mn_2O_3 dispersed throughout the spinel structure. See claim 1 of Howard. Howard does not teach or suggest all the claim limitations of the independent claims. Schulz teaches a process for preparing a nanocrystalline powder of an alloy made of at least two metals. Applicants submit that an alloy as taught by Schulz is considered as a final product prepared by mixing metals. However the claimed process comprises the step of "simultaneously applying a mechanical force from 0.1 to 1000 dyne/cm² and a heat energy from 50-200 degrees at a time from 5 minutes to 5 hours to a manganese compound to remove defects present in particles of

said manganese compound and to control the aggregation of microparticles and the shape of the aggregated particles".

Due to the explanation given above, the person skilled in the art would have no reason to consider the teaching of Schulz. There would be absolutely no motivation for the person skilled in the art to modify the teaching of Howard which does not teach applying heat at all with the teaching of Schulz which teaches the mixing of metals to make alloys and is therefore in a different technical field. Applicants respectfully submit that to combine Howard with Schulz is inadmissible. There would be no expectation of success to combine the teachings of Howard and Schulz since there is no advantage or expected beneficial result which would have been produced by their combination since, *inter alia*, the two teachings are in totally different technical fields and the simultaneously applying of mechanical force and heat energy as claimed in the independent claims 1, 10, 14 and 15 is not taught or suggested by either of the references.

VII. Re: item 6, rejection of currently pending claims 1, 2, 4-9, 14 and 15 under 35 U.S.C. 103(a) as being unpatentable over Sugeno '646 in view of Schulz.

The Examiner acknowledges on page 9 of the office action that Sugeno does not disclose what force is created on the reactants when they are being mixed. The Examiner further acknowledges that Sugeno does not disclose mixing takes place simultaneously with heating. The Examiner asserts that the claimed invention would be obvious for the person skilled in the art by combining the teaching of Sugeno and Schulz. The Applicants respectfully traverse the Examiner's assertion. In regard to Schulz, the Applicants refer to the arguments given in the proceeding section wherein the Applicants explained that the teaching of Schulz

cannot be combine with other teachings.

Applicants submit that Sugeno teaches to prepare a mixture of a manganese source and lithium source without heating. See Example 1. Then Sugeno teaches to heat the mixture at 450° C. See column 5, lines 1 and 2. Sugeno clearly teaches the mixing step with no heating. A person skilled in the art would not be motivated to apply heat to the mixing step. The Examiner makes the same assertion in regard to Sugeno as previously in regard to Howard. Sugeno and Schulz do no teach or suggest all the claim limitations. If Sugeno, as explained, does not teach or suggest the heating step at all, why should the person skilled in the art be motivated to combine the teaching of Sugeno with the teaching of Schulz which teaches mixing of metals to make alloys? The person skilled in the art would have no reason to combine the teachings of Sugeno and Schulz. Basically, the same arguments apply for the combined teaching of Sugeno and Schulz as already made in regard to Howard and Schulz in the previous section. The Applicants submit that for the same reason, as given in the preceding section in regard to Howard and Schulz, the combination of Sugeno and Schulz is inadmissible as well.

VIII. Re: item 8, rejections of currently pending claims 1, 2, 4-9 and 15 under 35 U.S.C. 103(a) as being unpatentable over JP 01263547 in view of Schulz.

The Examiner points out that JP 01263547 teaches crushing a lithium compound which can be lithium hydroxide and a manganese compound which can be manganese oxide, mixing them and then applying a heat treatment of 200°C or above for one hour. The Applicants respectfully remind the Examiner that the invention as claimed independent claims 1, 10, 14 and 15 recites "to simultaneously apply a mechanical force...and heat energy...to a

manganese compound to remove the defects present in particles of said manganese compound and to control the aggregation of microparticles and the shape of the aggregated particles". The process of the claimed invention is exactly the opposite of crushing a lithium compound as disclosed by JP 01263547. JP 10263547 teaches away from the claimed invention. The Examiner acknowledges that JP 01263547 does not even disclose that the crushing takes place simultaneously with the heating. JP 01263547 therefore teaches even further away from the claimed invention. The Examiner asserts that JP 01263547 combined with Schulz would make the claimed invention obvious to a person skilled in the art. The Applicants respectfully traverse the Examiner's assertion. In regard to Schulz, Applicants refer to the arguments made in the previous sections. The combined teaching of JP 01263547 and Schulz do not teach or suggest all the claim limitations. There would be no motivation for the person skilled in the art to combine the

teaching of JP 01263547 since this reference teaches away from the claimed invention as explained above. There would be no expectation of success by combining the teachings of JP 01263547 with the teaching of Schulz since JP 01263547 teaches away from the claimed invention and Schulz teaches in a different field. Finally, the Applicants submit that the combination of JP 01263547 and Schulz is inadmissible.

IX. Re: item 9, rejection of currently pending claims 1, 2 and 4-15 under 35 U.S.C. 103(a) as being unpatentable over JP 2000294239 in view of Sugeno '646 and further in view of Schulz. The Examiner points out that JP 2000294239 teaches grinding the electrolytic manganese dioxide after neutralization of lithium hydroxide on page 11 of the office action. The Applicants again submit that the claimed invention comprises the step of "simultaneously applying a mechanical force...and a heat energy...to manganese compound to

remove defects present in particles of said manganese compound and to control the aggregation of microparticles and the shape of the aggregation of particles". JP 2000294239 teaches grinding manganese dioxide after neutralization of lithium dioxide in paragraph 20. JP 2000294239 teaches that the ground material is thrown into the furnace for calcining in paragraph 21.

Applicants respectfully submit that grinding is opposite to controlled aggregation of microparticles and the shape of the aggregated particles as cited in the independent claims 1, 10, 14 and 15. Therefore, JP 2000294239 teaches away from the claimed invention. The person skilled in the art would have no motivation to modify the reference JP 2000294239 which teaches the step of grinding without heating and subsequent calcining therefore teaches away from the claimed invention. The Examiner asserts that the combined teaching of JP 2000294239, Sugeno and Schulz would make the claimed invention obvious to the person skilled in the art in paragraph 2 on page 12. The Applicants respectfully traverse the Examiner's assertion. As previously discussed, the person skilled in the art would have no reason and motivation to combine the teachings of Sugeno and Schulz. As explained in the beginning of this section, JP 2000294239 teaches away from the claimed invention. A combination of the teachings of the three references would not teach or suggest all the claim limitations. JP 2000294239 and Sugeno teach mixing or grinding with absolutely no heating. Schulz teaches in a different area. The combination of these two references with Schulz is therefore inadmissible. Further, there is no motivation for the person skilled in the art to modify the teaching of JP 2000294239 which teaches not to use heat and there would be no expectation of success in doing so.

The Applicants submit that the Examiner has failed to establish a *prima facia* case of obviousness in view of the cited prior art in regard to the currently amended independent claims 1, 10, 14 and 15. Applicants submit that since the independent claims 1, 10, 14 and 15 are non-obvious under 35 U.S.C. 103 in view of the cited prior art, then any depending claims 2-5, 8, 9, 11, 12, 13, 16 and 17 and 18 are non-obvious. See MPEP 2143.03.

x. Finally, Applicants submit in regard to new claims 16-18 the following. The mechanical force as claimed in claims 16-18 applies shear stress to the surface of the particles in the apparatus. This advantageously aggregates microparticles to increase particle size thereby decreasing particle size distribution, and removes defects present in the manganese particles. Moreover, claim 18 recites the apparatus as a mechanofusion mill which is advantageous for applying shear stress to the surface of the particles.

Clearly, the only motivation or suggestion to modify the teaching must be based upon the Applicants' disclosure and not in the references. The Examiner has obviously combined the references because of a hindsight view and not because currently amended

independent claims 1, 10, 14 and 15 are obvious over the cited prior art. The same applies for the dependent claims 2-5, 8, 9, 11-13 and 16-18. It is therefore Applicants belief that claims 1, 10, 14 and 15 are allowable over the cited references. In so far as dependent claims 2-5, 8, 9, 11-13 and 16-18 depend from independent claims 1 and 10, it is Applicants' belief that these claims are also allowable.

The Applicants submit that at least the claim amendments discussed above are not taught, described or suggested by the teaching of

the cited references and are therefore patentable. However, if the Examiner maintains his rejections of claims 1, 10, 14 and 15 and the dependent claims 2-5, 8-9 and 11-13 and 16-18 on these grounds, the Applicants respectfully request that the Examiner show where or how the cited references disclose each and every element of the rejected claims by reciting element numbers or specific portions of the reference by column and line number and how each discloses each and every element of the rejected claim. Hence, the Applicants respectfully submit that all claims of the application are patentable over the cited references in view of the above.

Reconsideration and allowance of the pending claims are respectfully solicited.

This application is now in condition for allowance. An early date of allowance is respectfully requested.

Applicants reserve the right to seek protection for any unclaimed subject matter, either subsequently in the prosecution of the present case or in a divisional or continuation application.

This response amends currently pending claims 1, 5, 10, 14 and 15 and adds new claims 16-18. The amendments and additions that are described in the preceding sentence were done to more fully claim the invention and were not done to overcome rejections under 35 U.S.C. 112, to overcome the prior art, or to overcome any other rejections or objections. The amendments and additions that are described in the first sentence of this paragraph shall not be considered necessary to overcome rejections under 35 U.S.C. 112,

shall not be considered necessary to overcome the prior art, and shall not be considered necessary to overcome any other rejections or objections.

The Commissioner is authorized to charge any additional fees which may be required or credit overpayment to deposit account no. 12-0415. In particular, if this response is not timely filed, then the Commissioner is authorized to treat this response as including a petition to extend the time period pursuant to 37 CFR 1.136 (a) requesting an extension of time of the number of months necessary to make this response timely filed and the petition fee due in connection therewith may be charged to deposit account no. 12-0415.

I hereby certify that this correspondence is being deposited with the United States Post Office with sufficient postage as first class mail in an envelope addressed to Commissioner for Patents

POB 1450, Alexandria, VA 22313-1450 on November 20, 2003

(Date of Deposit)

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Respectfully submitted,



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Enclosure:
RCE Transmittal and check for
\$770.